FETC SUCCESS

U.S. Department of Energy
Federal Energy Technology Center

CLEAN AFFORDABLE POWER

- [x] fossil energy
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Atmospheric Fluidized-Bed Combustion

States Impacted:
California, Colorado, Florida, Georgia, Illinois, Indiana, Kentucky, Minnesota, New York, Ohio, Pennsylvania, Texas, West Virginia

Benefit Areas:
Mining, Electrical Power Production, Acid Mine Drainage Reduction, Soil Improvement, Air and Water Quality Improvements

Participants:
Foster Wheeler Corporation, Tennessee Valley Authority, ARIPPA, Northern States Power Company, Archer-Daniels-Midland, Texas-New Mexico Power Company, Babcock & Wilcox, International Paper, City of Seattle, Washington, Air Products

FETC Contact:

Donald Bonk**

Office: (304) 285-4889
E-Mail: dbonk@fetc.doe.gov

MAIL ADDRESS:

* U.S. Department of Energy
P.O. Box 10940
626 Cochrans Mill Road
Pittsburgh, PA 15236-0940

**U.S. Department of Energy
P.O. Box 880
3610 Collins Ferry Road
Morgantown, WV 26507-0880

WEBSITE:
www.fetc.doe.gov

Description

The development of fluidized bed combustors is probably the most significant advance in coal-fired boiler technology in more than half a century. Atmospheric fluidized-bed combustion (AFBC) units can burn a variety of low-grade fuels, including Pennsylvania anthracite culm, as well as refuse from coal washing plants. AFBC technology has become so popular that every major U.S. boiler manufacturer offers an AFBC system in its product line; there are now more than 170 AFBC systems of varying capacity in operation.

AFBC technology has progressed to larger scale utility applications. For example, the Colorado-Ute Electric Association project in Nucla, Colorado, (now operated by Tri-State Generation and Transmission Association, Inc., of Denver) was one of the early Clean Coal Technology (CCT) demonstrations. Efforts under this project resulted in significant design improvements in AFBC, and led to commercial confidence in this state-of-the-art, low-polluting combustion system. Today, more than $6.2 billion in domestic sales and $2.8 billion in foreign sales have resulted from the U.S. public and private investment in circulating fluidized-bed technology research, development, and demonstration. These sales support 75,000 new jobs for the U.S.

Goals

The goal is to encourage the use of AFBC technology in utility applications.

Tangible Benefits

National: AFBC technology yields significant reductions in NO_x and sulfur emissions and has resulted in improved air quality nationwide. Using limestone for in-situ sulfur capture also produces usable by-products, improves ash disposal conditioning, and lessens water quality concerns caused by leaching.

Regional: At least 20 AFBC units are currently operating or under construction in the coal-producing regions of the U.S. Some of these will burn the less desirable feedstocks, for example, using coal waste piles as a feedstock. This improves the aesthetics in the area around the generating station, while generating low-cost electricity. By-product ash will be used to neutralize the acidity in soil around the plant, thereby reducing acid mine drainage.

Local: AFBC systems burn coal waste near both FETC sites in Morgantown, West Virginia, and Pittsburgh, Pennsylvania. These systems have created local employment opportunities, while producing low-cost electricity and reducing acid mine drainage into local watersheds.

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